

Remarks

The various parts of the Office Action (and other matters, if any) are discussed below under appropriate headings.

Allowable Subject Matter

The indicated allowability of claims 2-8, 12 and 13 is noted with appreciation. Rewriting of these claims in independent form is being deferred pending reconsideration of the claim rejections.

Withdrawal of the Finality of the Office Action

In the event the Examiner intends to maintain any rejection of the claims as being unpatentable over the prior art, request is made for withdrawal of the finality of the last Office Action as the finality was premature. The amendment made to claim 1, for example, does not appear to have necessitated the new grounds of rejection based on Laming. Consequently the Examiner may be amenable to further amendment even though the Office Action was made final.

Claim Rejections - 35 USC § 102 and § 103

The Examiner is of the view that claim 1 lacks novelty over newly-cited US 6,549,705 (Laming). The method described in Laming is different from the method of claim 1.

Laming describes a method for writing a grating into the core of an optical fibre. A fringe pattern is generated by interfering diffracted beams from an incident light beam, and is exposed onto the photosensitive core of an optical fibre. This writes a grating into the core.

According to claim 1, relative movement between the sample and the light spot with its static periodic intensity pattern along the path of the channel defines the channel by exposing parts of the photosensitive region to the light spot to produce a change in refractive index. In contrast, Laming writes a grating into a pre-existing waveguide channel (the core of the fibre). The exposure to the fringe pattern plays no part in forming the channel itself. The channel was previously made when the fibre was fabricated, and the fringe pattern does not affect the presence or size of the channel in any way. The width of the fringe pattern is not of interest or consequence beyond that it at least extends across the width of the core.

In response to previously submitted comments regarding different rejections, the Examiner states that "a waveguiding channel can be a portion of a larger waveguide, so long as the waveguiding channel itself allows for guided wave propagation and is in a channel form." While this may be generally true, it is not seen how this comment is relevant. Presumably, the Examiner intends by this statement that the grating written by Laming can be understood as a waveguiding channel in the context of claim 1, so that Laming discloses "A method of writing a waveguiding channel of increased refractive index into a sample, the channel having a width and a path..." as set forth in claim 1. The grating of Laming, however, cannot be understood in this way.

In Laming, the fringe pattern writes a grating only, the grating being written into a pre-existing waveguiding channel (the core of the fibre). The grating *per se* cannot be considered as a waveguiding channel. Any waveguiding ability of the grating comes only from the pre-existing fibre core. The fringe pattern does not form a waveguiding channel. If the method of Laming was applied to a photosensitive material in which a waveguiding channel had not previously been formed, the method would not produce a waveguiding channel. It would only produce a grating, which on its own does not provide guide wave propagation. Also, the width of the channel in Laming is the width of the core, which is pre-existing and does not depend in any way on the width of the fringe pattern.

Hence, Laming does not describe the claim 1 features of "A method of writing a waveguiding channel of increased refractive index into a sample..." and "causing relative movement between the sample and the light spot... to define the channel...." Laming writes a grating, not a waveguiding channel, and the channel is already defined during the fibre fabrication, not defined by exposure to the light spot.

The width of the light spot is what defines the width of the channel. Exposure to the light spot via the relative movement produces the waveguiding channel plus any gratings desired to be written into the channel, so the width of the channel and the width of any gratings depends on the spot width. In some cases, the width of channel may be the same as the spot width. In other cases, a more complex relationship may exist (see page 14, last paragraph of the PCT publication). In all cases, however, the spot width is selected so as to produce a channel of the desired width, according to the particular relationship that exists between spot width and channel width. This is the feature of "the spot...having a width which is related to the width of the channel". Under the Examiner's interpretation of this feature, the use of a spot with a width that is at least as wide the channel would not work, because the resulting channel could be wider than desired if the spot width is larger than the desired channel width.

In contrast, Laming does not actually write any waveguiding channel, so the size of the fringe pattern is not selected with regard to any desired channel width. Laming does not describe that the width of the fringe pattern relates to the width of the channel. The only information in Laming regarding the pattern size is that the illuminated phase mask would have a spot size of 30 microns (column 4, line 62). This dimension has a bearing on the ability of write gratings of varying period, but in this case the relevant dimension is that along the length of the grating, which is perpendicular to the grating planes and the width of the fibre core. 30 microns is far larger than the width of a fibre core, which is typically 6-10 microns, so a large part of the light will miss the core.

However, the fibre core is the only photosensitive part, so this is of no concern. The width of the light pattern does not define the width of the core, which already exists. Hence, Laming does not teach the noted feature of claim 1. If the Examiner desires further clarification of this feature, one proposal would be to recite "and a width which is related to the width of the channel such that the spot can produce a channel of the desired width". Support for this can be found on page 14, lines 26-27 of the PCT publication. In Laming, the fringe pattern does not produce a channel of a desired width, because the channel already exists. The Examiner is invited to phone applicants' undersigned representative if the noted amendment would be viewed favorably by the Examiner in the event the Examiner is not yet convinced that the claims are patentable over Laming.

Conclusion

In view of the foregoing, request is made for timely issuance of a notice of allowance.

Respectfully submitted,

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